

MACROMOLECULAR STRUCTURE AND COALIFICATION. J. W. Larsen, Dept. of Chemistry,
Lehigh University, Bethlehem, PA 18015

After having been proposed and ignored several times, the macromolecular gel structure of coals is gaining acceptance. It provides a useful and enlightening framework within which to discuss the coalification process. Indeed, if early results are general, major revisions in coalification models will be necessary. Between ca 78% C and 86% C, the cross-link densities of coals generally decrease. Over this range, coalification is probably a depolymerization. This notion is supported by the molecular weight distributions of pyridine extracts. Above 88% C, a rapid polymerization takes place as coalification increases. It is possible that the depolymerization results in part from a loss of ether linkages during coalification. It is tempting to associate the increase in cross-link density above 88% C with bonds formed as a result of dehydrogenation. Natural deoxygenation and dehydrogenation have very different consequences for coal structure.